

NORTHWEST RESIDENTIAL HVAC MARKET TRENDS

BPA WEBINAR
SEPTEMBER 1, 2022



Why **Res HVAC**?

RAPIDLY EVOLVING MARKET

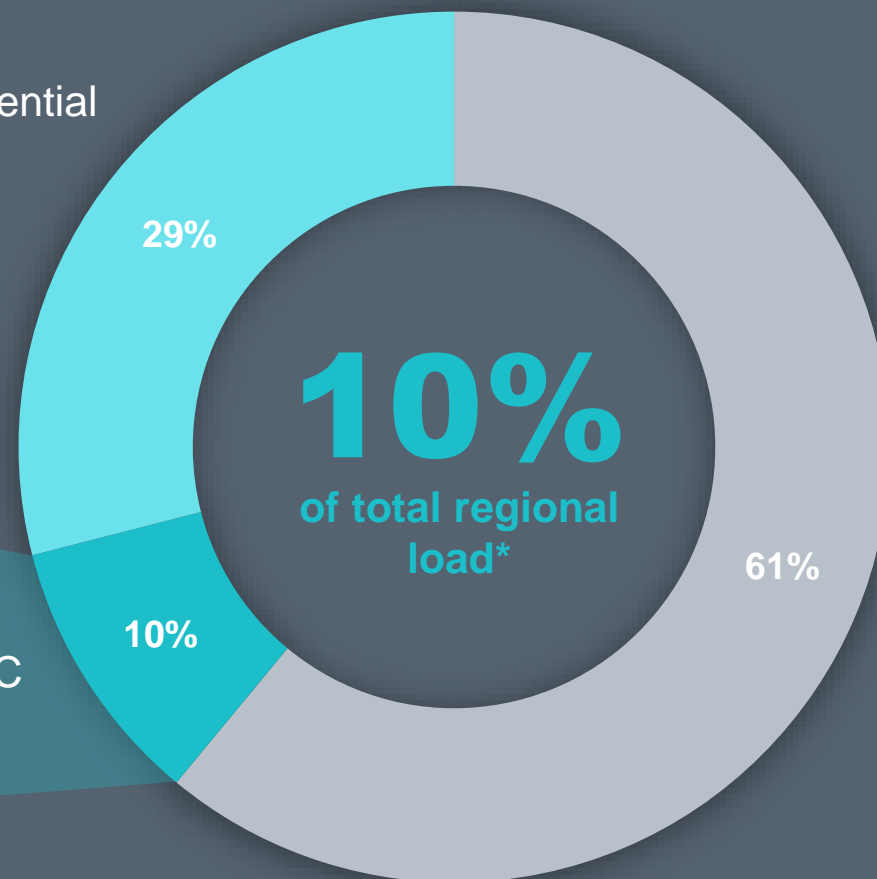
Heat pump technologies

Demand for cooling

Weatherization & thermostats

Residential HVAC

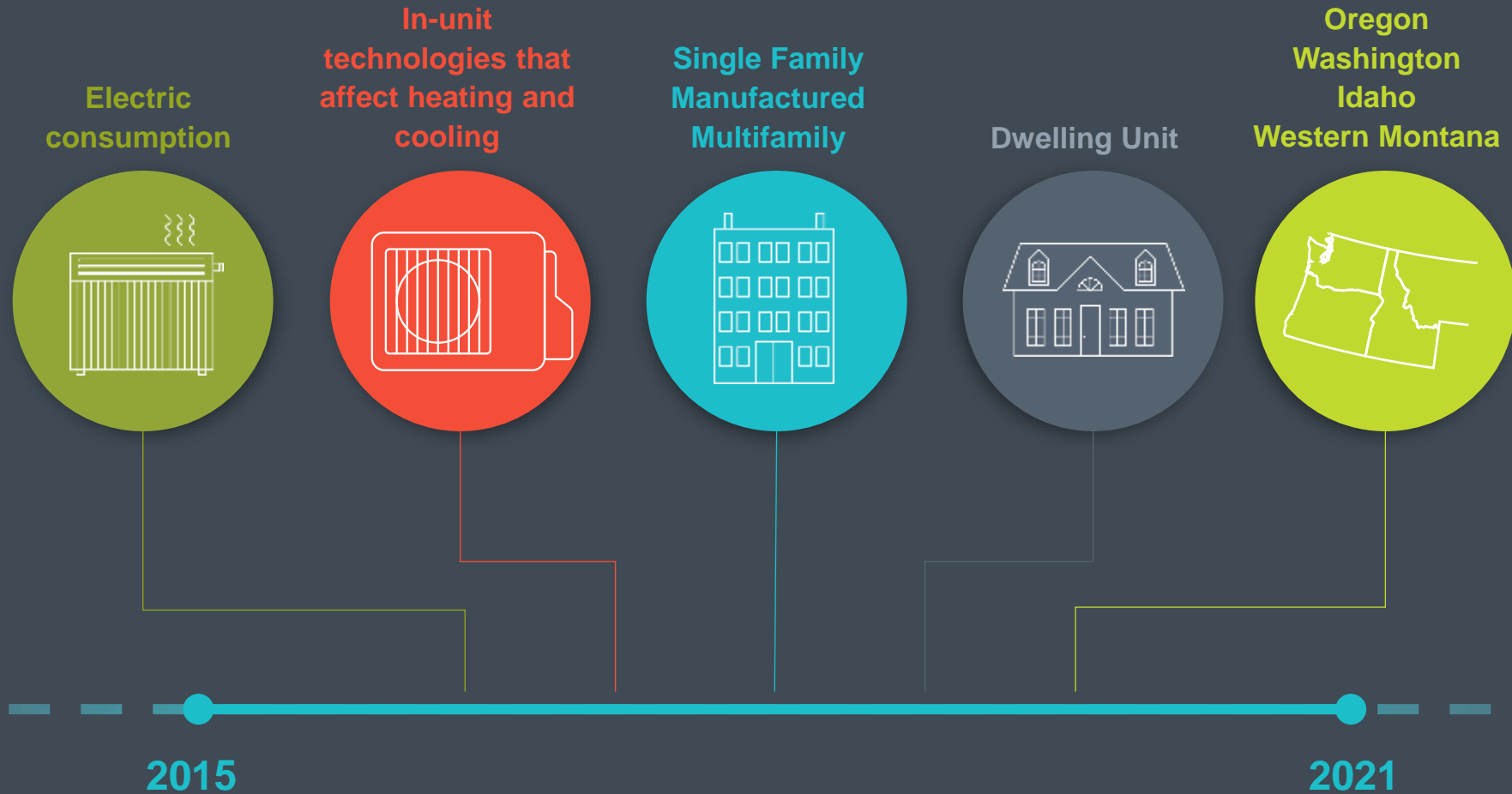
Other Residential




Non-Residential

**2018 Consumption in the 2021 Power Plan*

What do we mean by the **Res HVAC** market?



Total regional residential HVAC electric consumption has **increased**

 aMW at Busbar

2015

2,528 aMW

2016

2,548 aMW

2017

2,575 aMW

2018

2,601 aMW

2019

2,632 aMW

2020

2,665 aMW

2021

2,696 aMW

WHAT TRENDS ARE BEHIND THAT HVAC ENERGY CONSUMPTION?



The increase in consumption comes from **added cooling**



Cooling consumption

2015
280 aMW

2016
287 aMW

2017
297 aMW

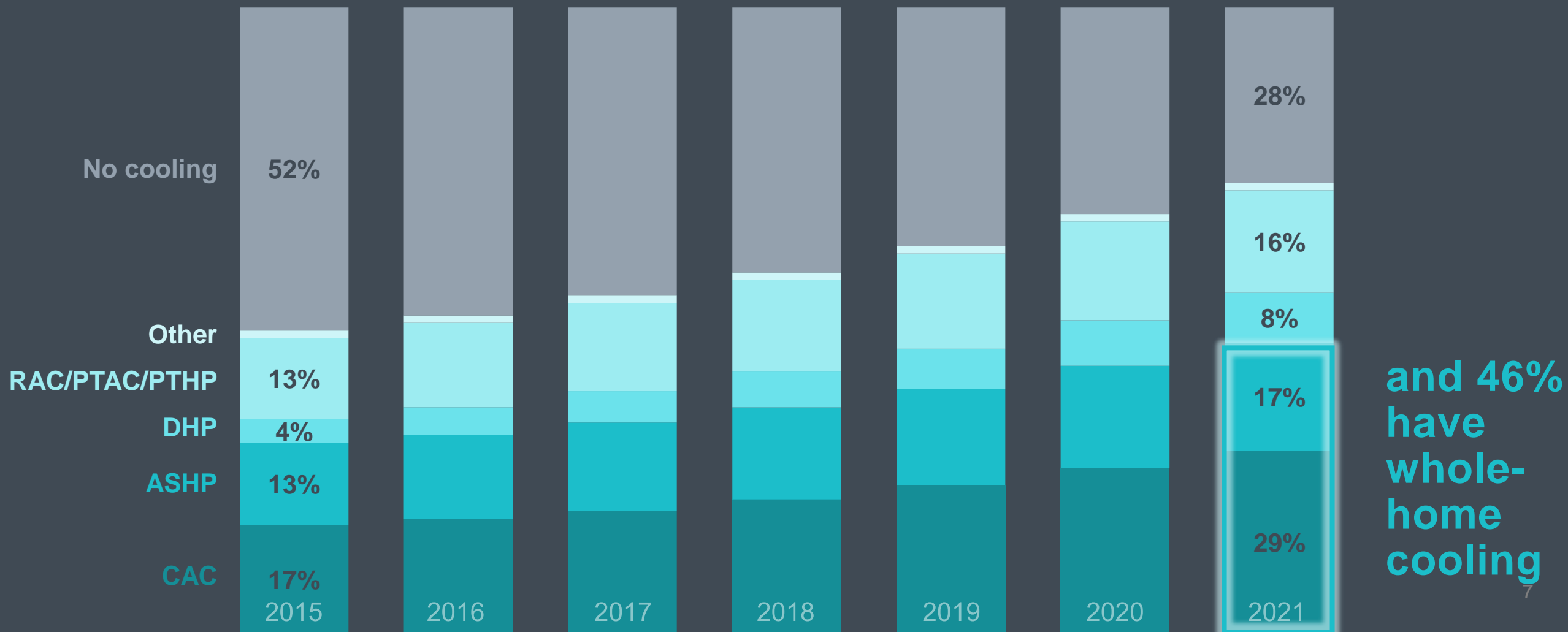
2018
311 aMW

2019
328 aMW

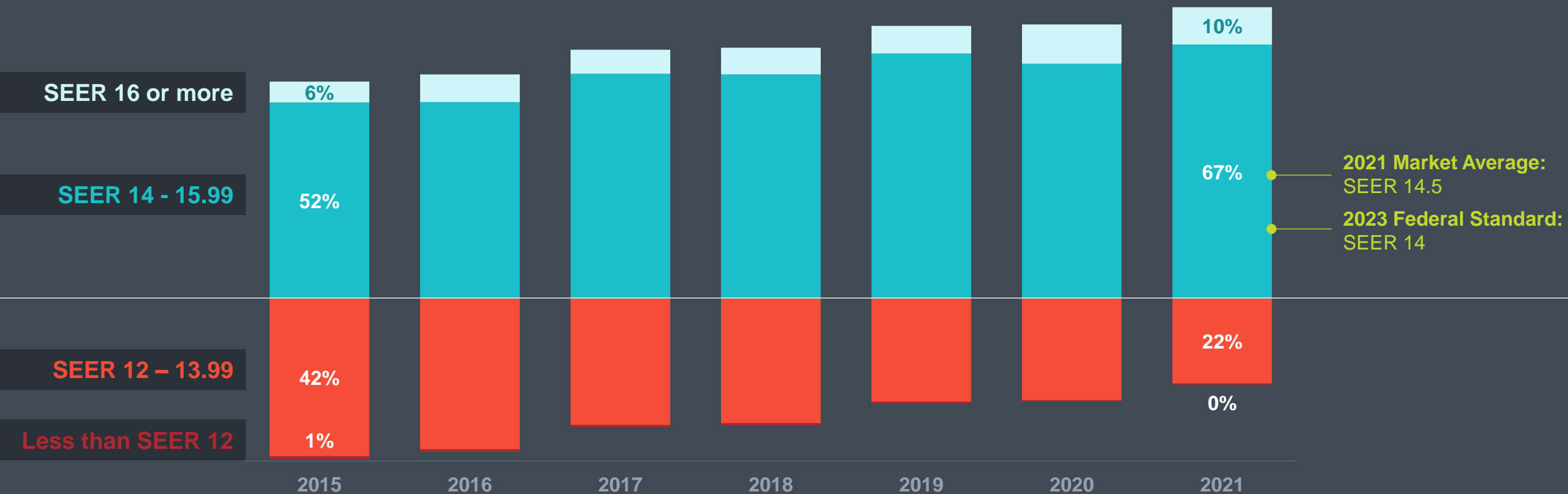
2020
351 aMW

2021
372 aMW

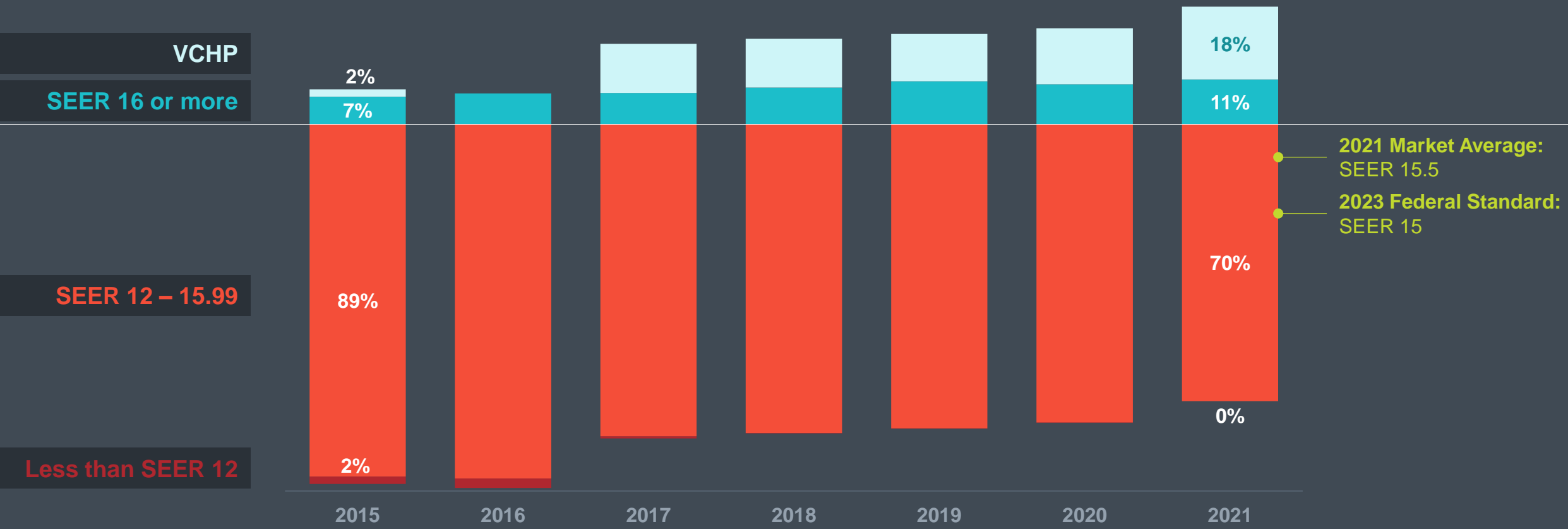
By 2021, **72%** of homes have a form of cooling



Fortunately, equipment ratings of new CACs are **going up**



ASHP market average SEER has exceeded 2023 Federal Standard



VCHP sales have reached a **fifth** of the ASHP market

Variable Capacity (or speed) Heat Pumps

Compressor speed varies based on demand

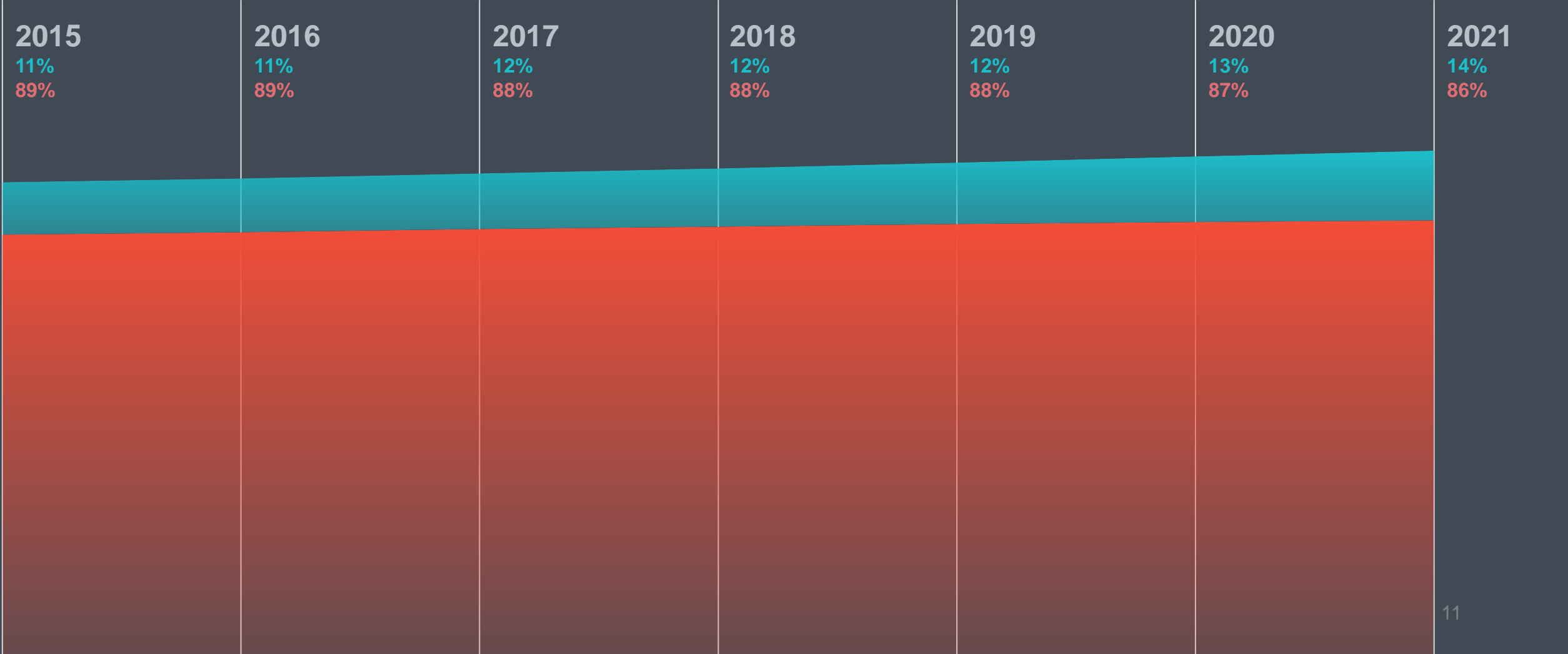
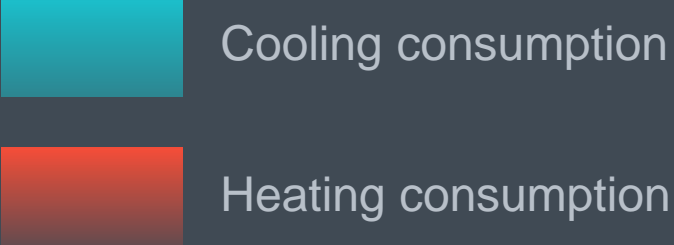
Not tied to SEER/HSFP

Single- or two-stage



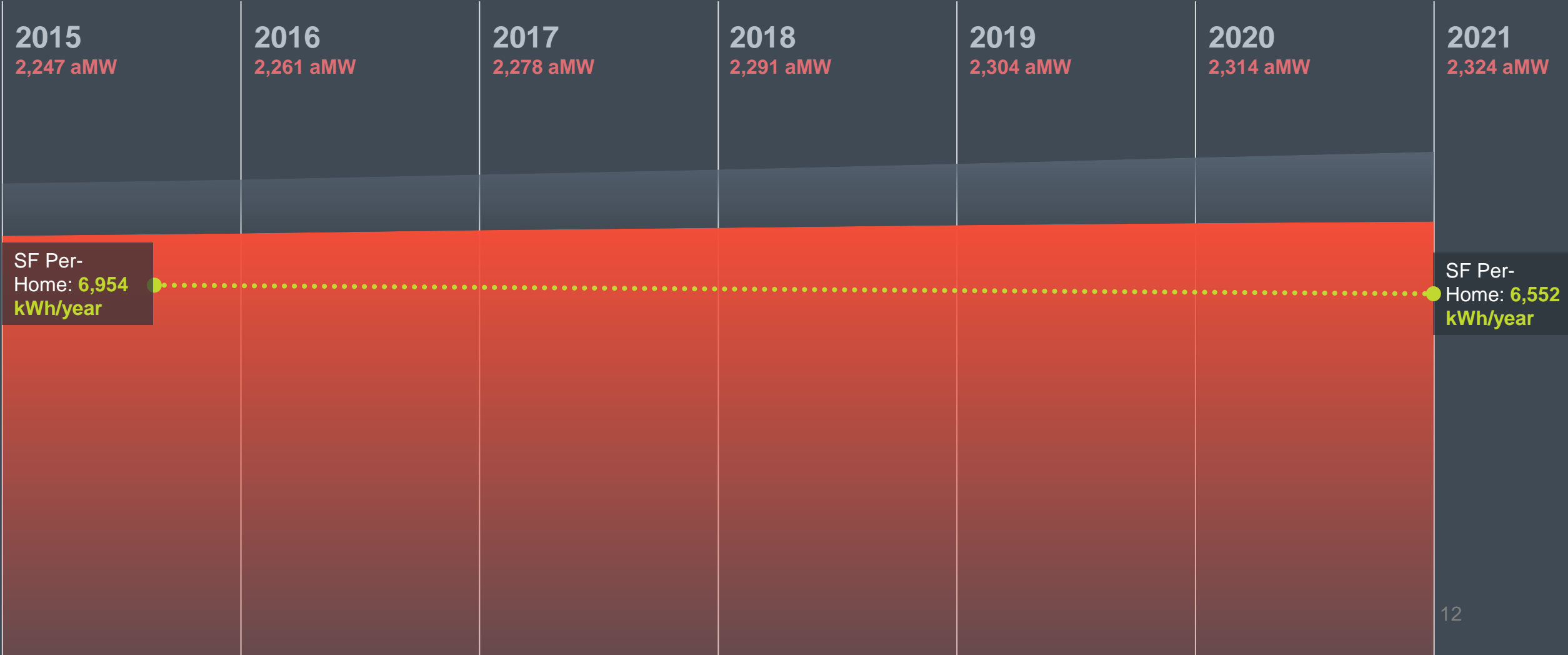
Variable speed

We're still a **heating-**dominant region

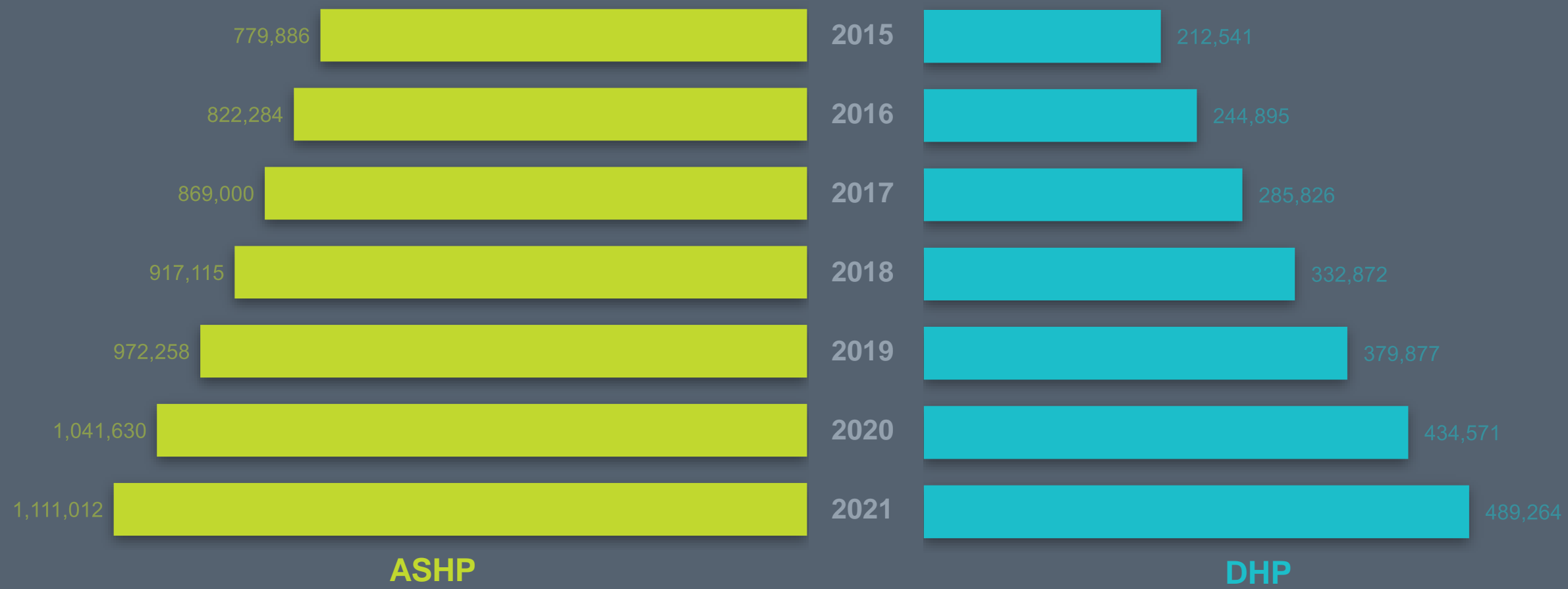


Demand for cooling has led to heating efficiency gains

 Heating consumption

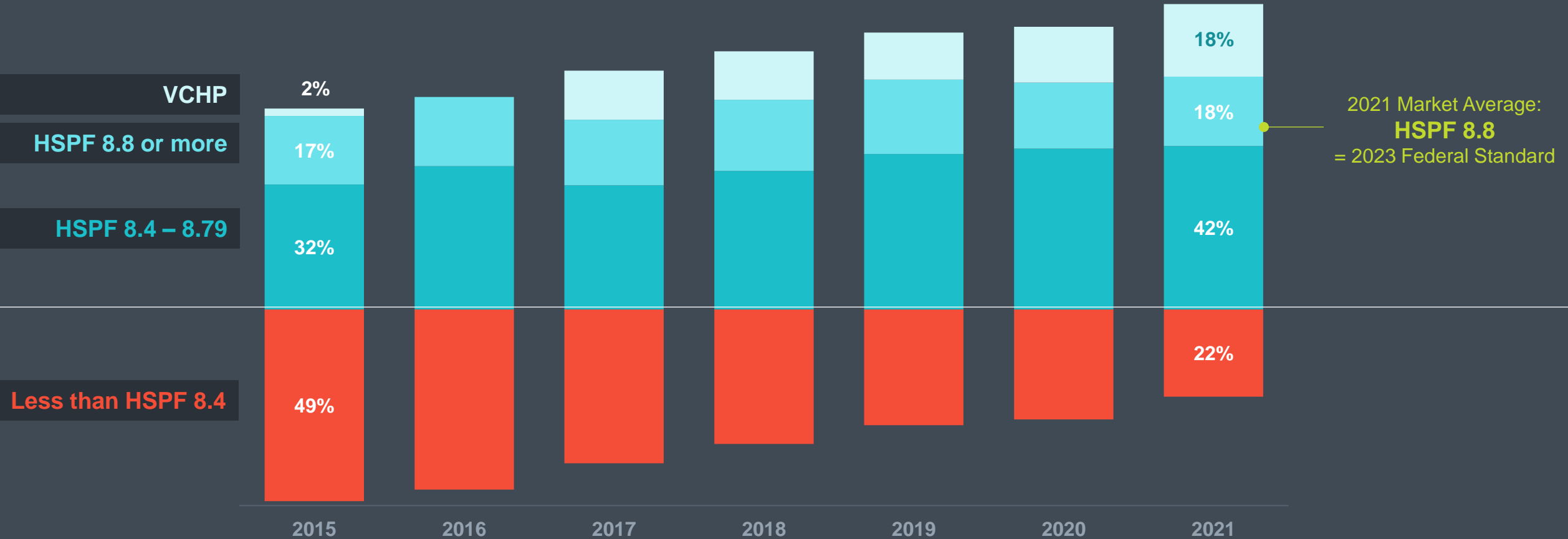


More than a quarter of homes use **ASHPs and DHPs** for primary heating



NUMBER OF HOMES WITH ASHP AND DHP AS PRIMARY HEATING TECHNOLOGY

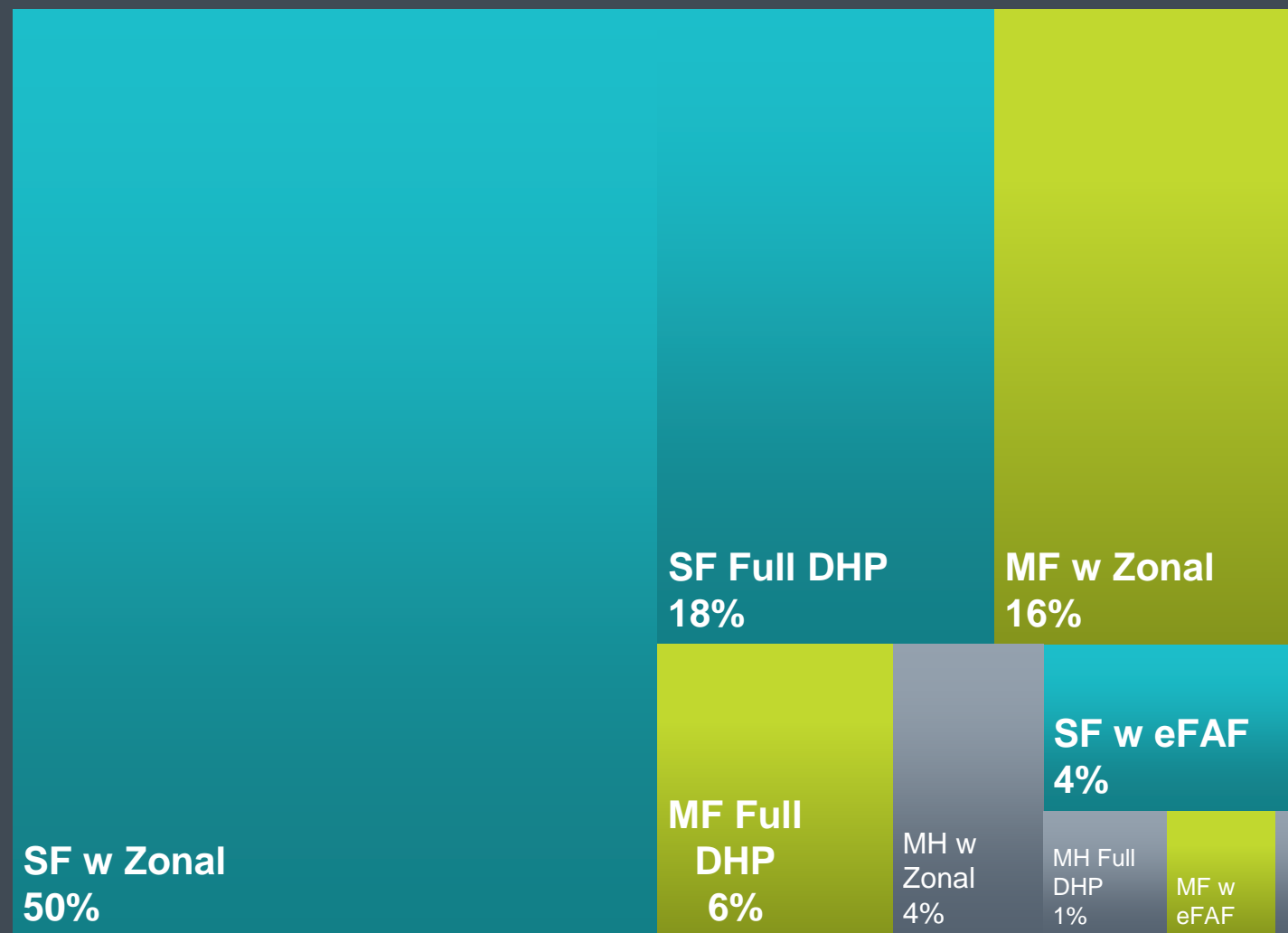
When people purchase ASHPs, we see heating ratings **improving**



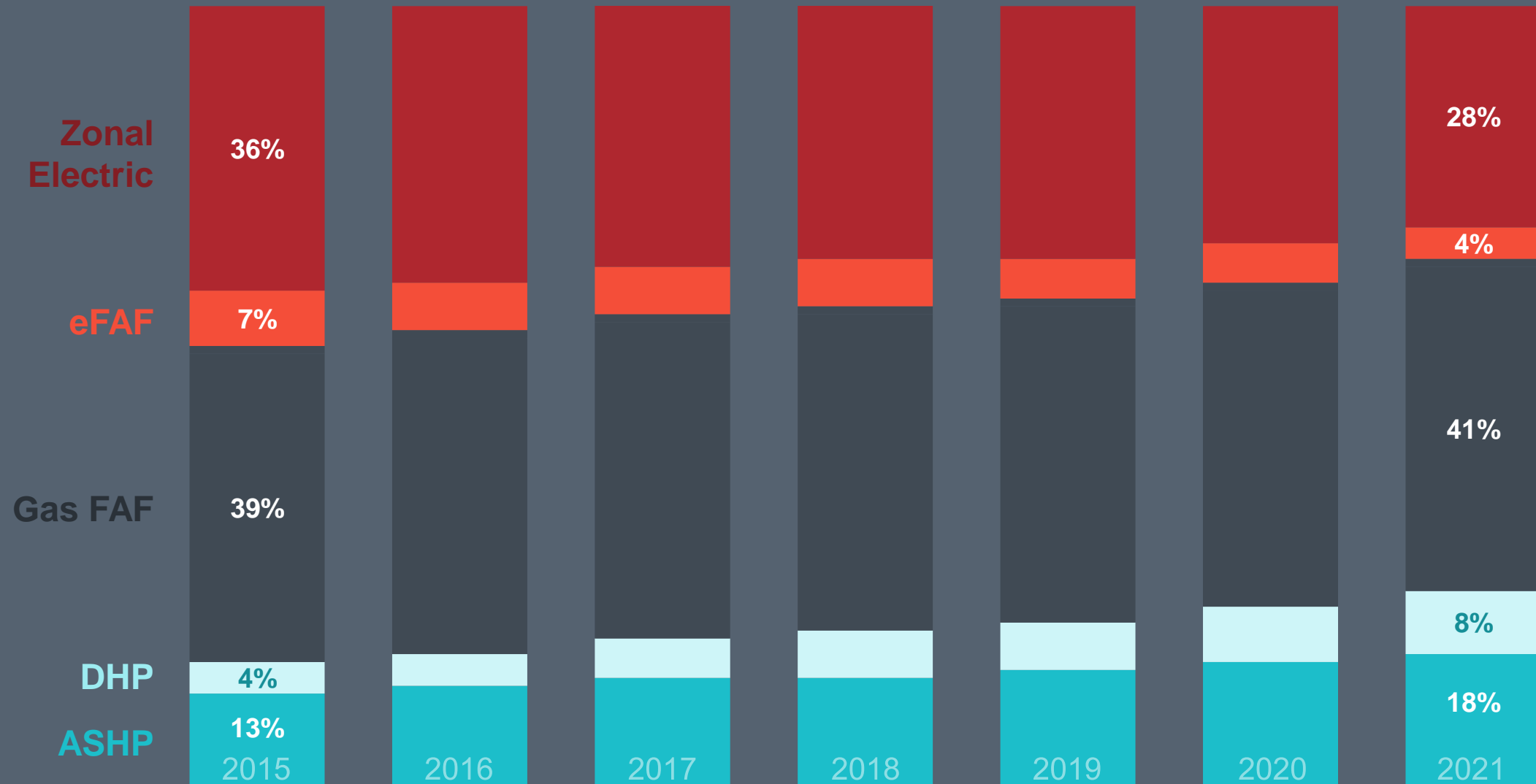
Most DHPs are in **Single Family** homes with **Electric Zonal** heat



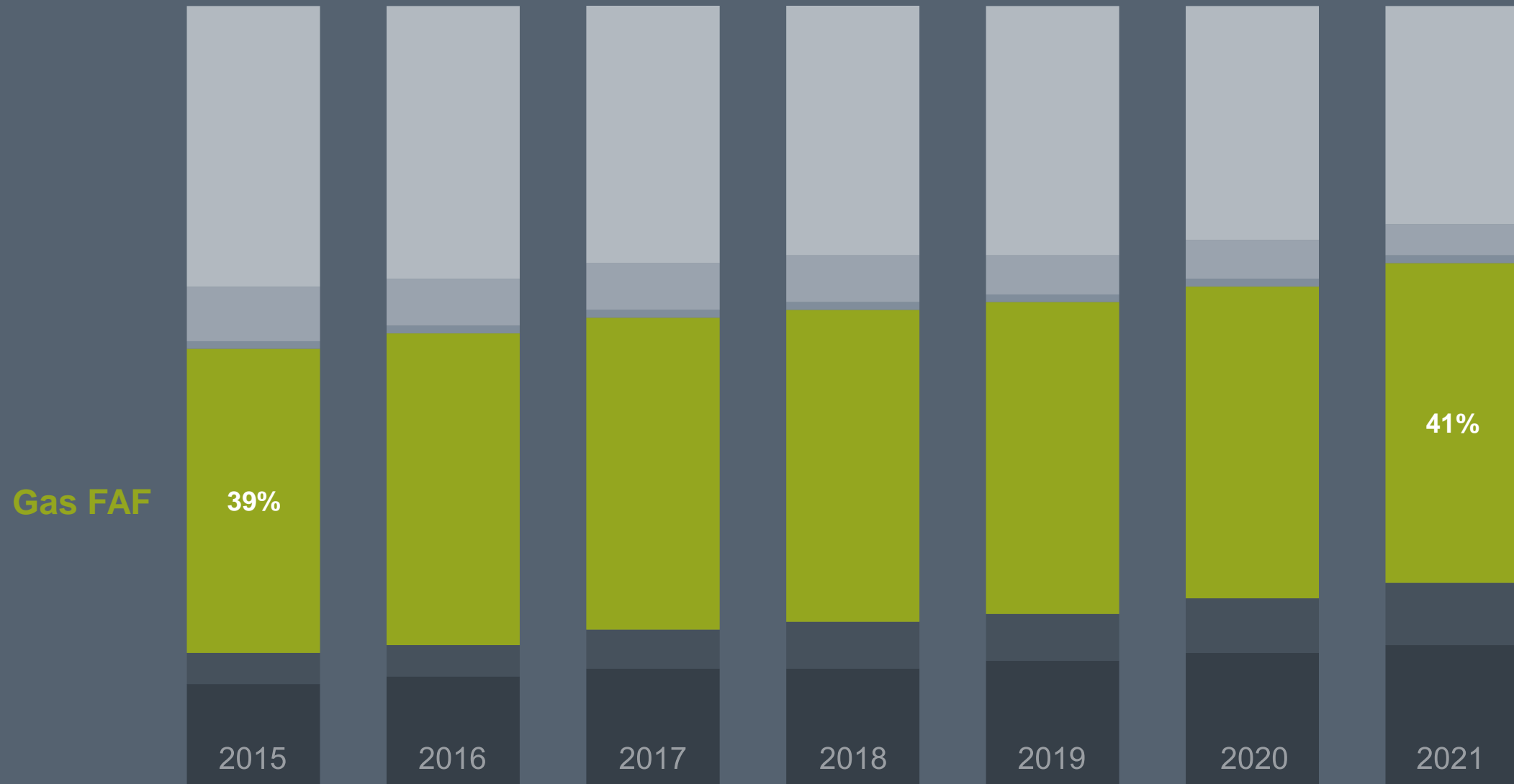
Multifamily homes installing
DHPs **faster** than manufactured
homes.



Heat pumps primarily replace **eFAF** and **zonal electric**



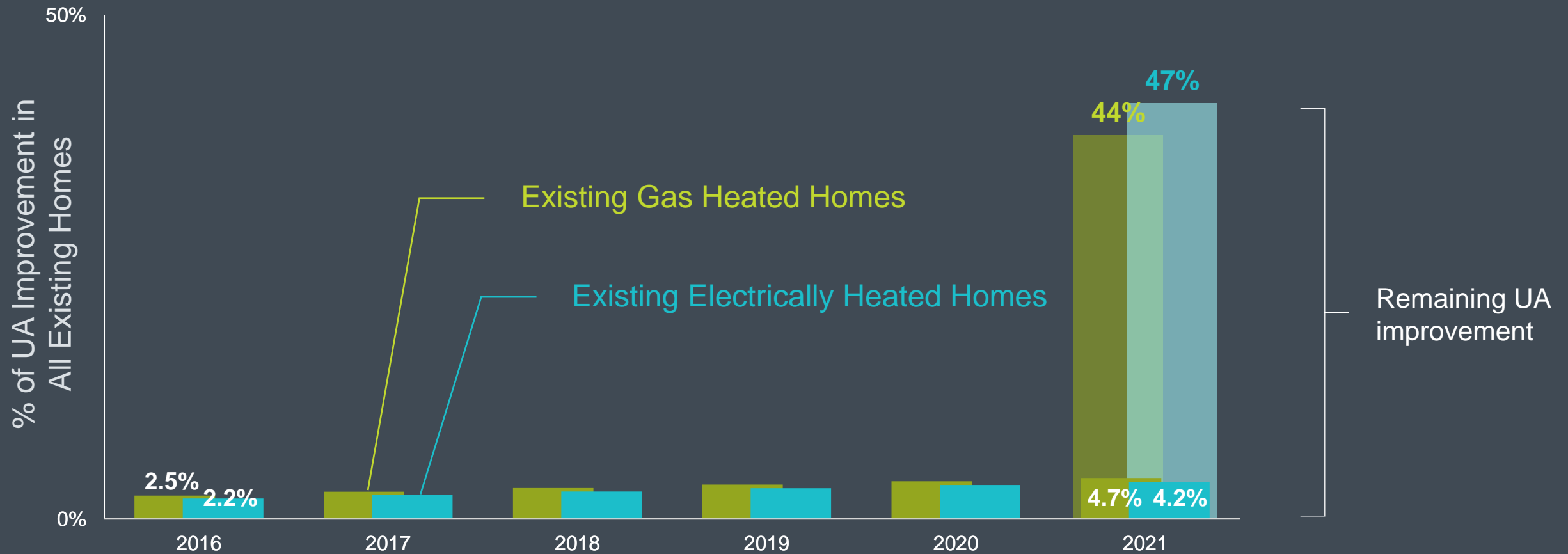
Interestingly, share of gas furnaces
in the stock has **held steady**



WHAT ELSE IMPACTS HVAC ENERGY CONSUMPTION?



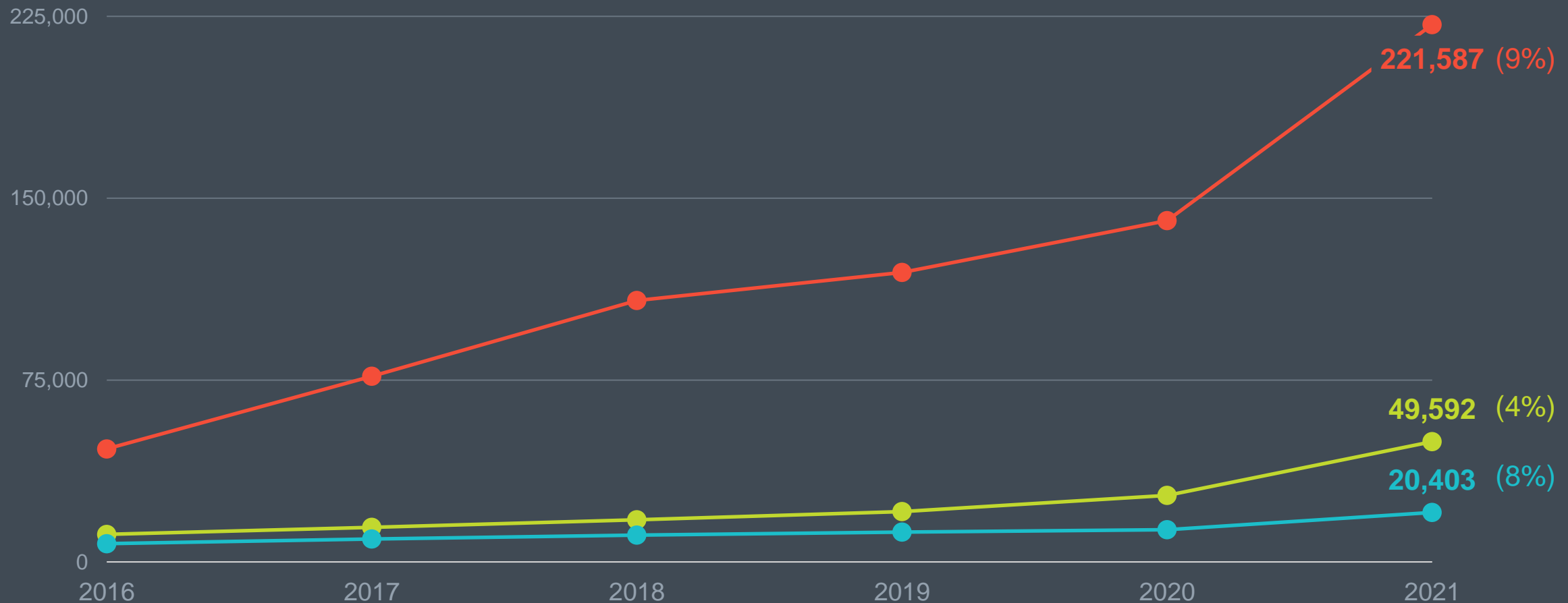
Building shell conditions are improving, but there are still **plenty of opportunities**



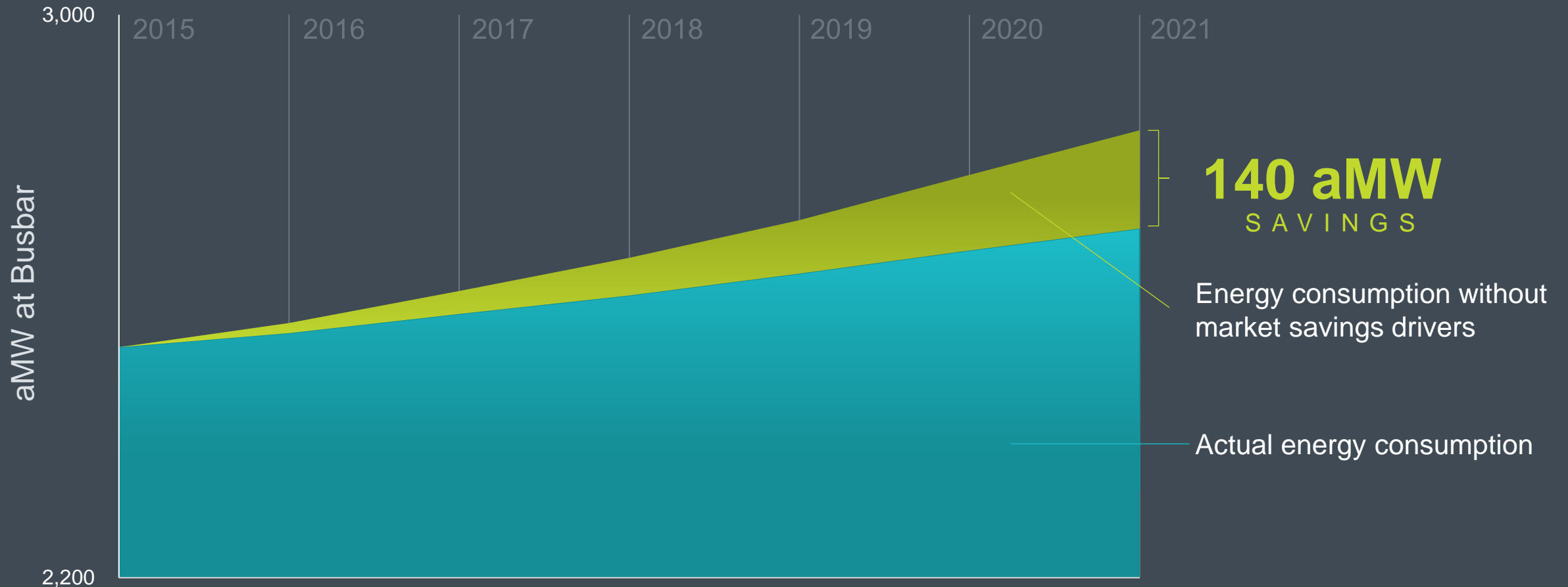
We've seen growth in Advanced Smart Thermostats, but **could see more**

- Gas FAF
- ASHP
- Electric FAF

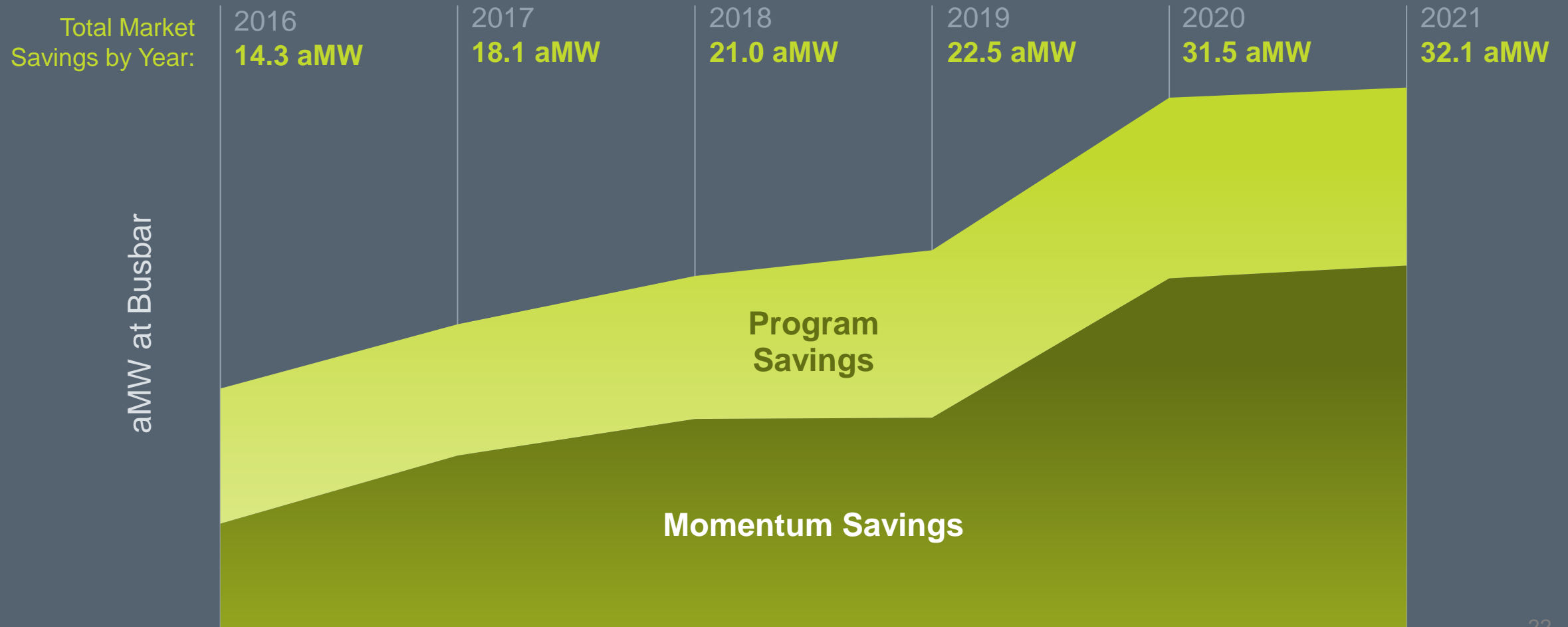
Installed Advanced Smart Thermostats



Efficient equipment and non-equipment upgrades drive market savings



Programs have paved the way

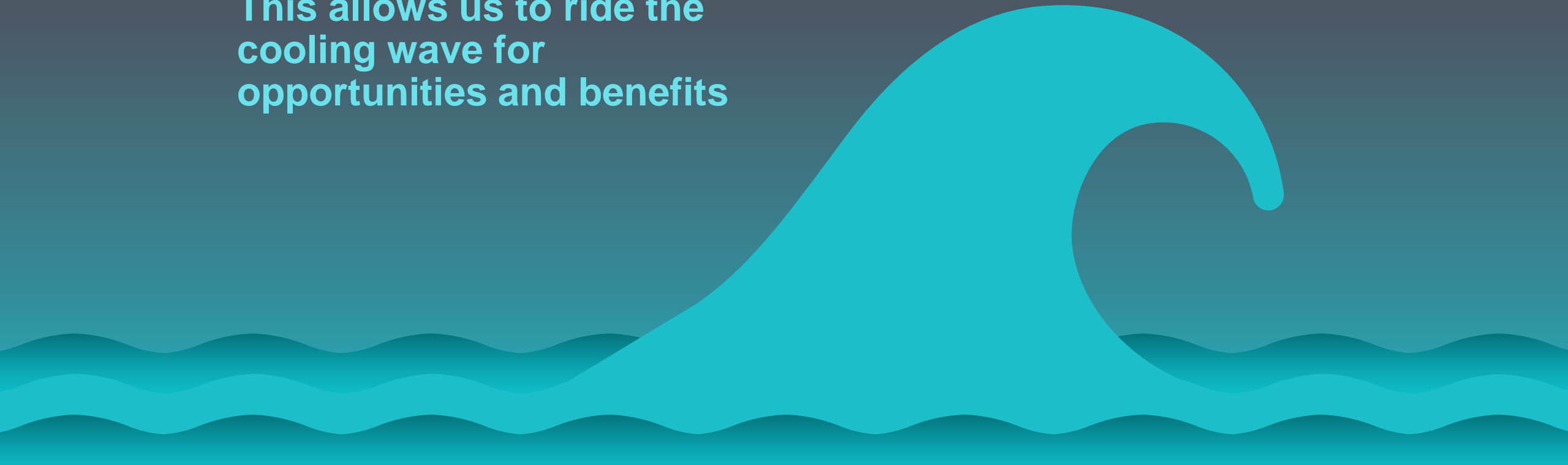


WHERE ARE OPPORTUNITIES FOR THE FUTURE?



ASHPs and DHPs will continue to be
a **crucial technology**

This allows us to ride the
cooling wave for
opportunities and benefits



Where does the **research** go from here?

RBSA III

New HVAC Sales Data

VCHP and Tech-Specific Studies

RTF Measure Updates



CONTACT

For more information, visit

<https://www.bpa.gov/energy-and-services/efficiency/market-research-and-momentum-savings/hvac-market-research>

Questions? Contact

Joan Wang

jjwang@bpa.gov

